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and if the volume of the ocean be considered 300,000,000 cubic miles, a total amount of gold in sea water of sixty billion tons. Yet this amount is probably insignificant in comparison with the amount of gold disseminated in crystalline and sedimentary rocks apart from gold in veins and other deposits. Experiments seem to indicate that sea water contains about the same amount of silver and gold.

PROF. F. P. VENABLE'S work on 'The Development of the Periodic Law' has just appeared from the press of the Chemical Publishing Company. It is a book of over three hundred pages, dealing exhaustively with subjects from the days of Dalton and Prout down to the present year, and covering a phase of chemical history hitherto vacant.

ON October 1st appeared the initial number of a new periodical in chemical technology, the *Chemische Rundschau: Zeitschrift für die gesamte chemische Industrie*. It is a quarto of twenty-four pages, to appear semi-monthly, at sixteen Marks per year. Its editor is Dr. Franz Peters, assistant at the Technische Hochschule at Charlottenburg, and it is published in Berlin. The first number contains several pages of original matter, a rather larger number devoted to abstracts, and quite full trade notes, together with book reviews, society proceedings and patent lists.

THE idea suggested by Prof. Ramsay in connection with his work on Helium, that it is possible that all atoms of the same chemical element do not possess exactly the same weight, and which was also suggested by Prof. Crookes in connection with his work upon the rare earths, is by no means new. Before Stas entered upon his great work on atomic weights he raised the question as to whether these weights were unchangeable, but after experiment decided it in the affirmative (Stas: *Untersuchung*

über die Gesetze der chemischen Proportionen, etc. Deutsch von L. Aronstein, Leipzig, 1867, p. 3). Again in 1883, working on the analysis of Caucasian petroleum, Schützenberger was unable to explain certain quantitative anomalies in the amount of carbon dioxid obtained, and Butlerow proposed as a most probable cause a variation in weight of the carbon atom (Bull. Soc. Chim., 39: 258, 263). This question has also been discussed on theoretical grounds by Marignac, Kremers and Cooke. Prof. Ramsay's promised experiments on the fractional diffusion of oxygen and nitrogen through clay septa will be awaited with interest as a valuable contribution to the subject.

J. L. H.

SCIENTIFIC NOTES AND NEWS.

A BUILDING FOR THE SCIENTIFIC SOCIETIES OF NEW YORK.

MR. CHARLES F. COX, Treasurer of the New York Academy of Sciences, has addressed a letter to the editor of the *Evening Post* appealing to a man of wealth or a group of men to provide a suitable building for the societies composing the Scientific Alliance of New York.

The counsel of the Alliance was last year incorporated under a charter which gives it power to receive gifts and bequests and to hold real estate for the benefit of the organizations which it represents. The combined membership of these societies is now over 1,000. Nearly all of them issue valuable publications; several of them own important libraries and growing collections of specimens, and all are actively engaged in original research as well as the popular presentation of scientific topics.

The societies suffer from lack of a suitable building similar to that of Burlington House, London, but in New York this can only be provided by the enlightened liberality of private citizens. The proposed building should be located in the center of the city, and should be large enough to contain: a lecture-hall having a seating capacity of not less than 1,200, in which free popular lectures could be given frequently; a library with shelf-room for not less 100,000

volumes, in which should be formed a model collection of works of reference in every department of science; a meeting-room to accommodate say 250 persons, in which the ordinary sessions of the several societies would be held; a smaller room for each of the constituent organizations, in which its private records and papers might be kept and where its committee meetings could be held and other detail work performed; and finally a few small laboratories and a photographic room for the common use of all members.

SPECIALISM AT THE BRITISH ASSOCIATION.

THE forthcoming number of *Natural Science* will contain a timely protest against the presentation of trivial papers, or of technical papers that should be printed rather than read, at meetings of the British Association. The editorial article continues: "Of course, the wise man does not go to hear these papers; he knows that many of them are read for the sake of self-advertisement, and that any which are of value will soon be accessible through the ordinary channels of publication. For all that, it seems well to protest, if only in the hope that our words may reach the Canadian cousins who are preparing so splendid a welcome for the Association next year. These papers not merely clog the work of the sections, but have an effect directly contrary to the main object of the Association. Some, perhaps, read by local naturalists, or descriptive of local phenomena, to which the attention of visitors should be directed, are not to be discouraged, but the rest both frighten away the people whom the Association wishes to attract, and, what we feel to be of more importance, tend to split the scientific visitors themselves still further among sections. The Association should rise above the specialism of most of our learned societies; it should offer a field where the zoologist might confer with the botanist, where both might exchange experiences with the geologist, and where all three might pick up something of use to them from the physicist and chemist, who in their turn need not go the poorer away. Let there be more discussions on matters of general interest, and let them be thrown open to even more sections. Why, for

instance, should the discussion of Neo-Lamarckism have been confined to zoologists? Surely some of the physical problems that were hinted at in the discussion on the cell might have been laid before the physicists."

GENERAL.

FOLLOWING on the death of Ferdinand Baron von Müller the death is announced of Dr. Henry Trimen, who occupied a position in Ceylon somewhat similar to that held by Müller in Australia. Trimen died on October 16th, at Peradeniya, at the age of fifty-two. Before leaving England he had been curator of the anatomical museum of King's College and senior assistant of the botanical department of the British Museum. He edited the *Journal of Botany* from 1872 to 1879. In 1880 he was appointed director of the Royal Botanic Garden at Ceylon. He made numerous contributions to our knowledge of the flora of the island, and introduced into cultivation many useful products from foreign countries.

DR. GEORGE HARLEY, a distinguished English physician and versatile writer, died in London on October 27th.

PROF. L. L. DYCHE, of the University of Kansas, has returned from Alaska, where he has explored Cook's Inlet and the Knik river, and has obtained many valuable zoological specimens.

A SERIOUS explosion occurred in Paris on October 17th. A tube containing acetylene exploded and the building used by M. Raoul Pictet, the well known chemist, for the manufacture of acetylene was entirely destroyed.

It is announced in *Nature* that the following have been nominated by the Council of the London Mathematical Society for election as the Council and officers for the ensuing session: President, Prof. Elliott, F. R. S.; Vice-Presidents, Major Macmahon, R. A., F. R. S., M. Jenkins and Dr. Hobson, F. R. S.; Treasurer, Dr. J. Larmor, F. R. S.; Secretaries, R. Tucker and A. E. H. Love, F. R. S.; other members, Lieut.-Col. Cunningham, R. E., H. T. Gerrans, Dr. Glaisher, F. R. S., Prof. Greenhill, F. R. S., Prof. Hill, F. R. S., Prof. Hudson, A. B. Kempe, F. R. S., F. S. Macaulay and D. B. Mair. At

the annual general meeting of the Society, which will be held on November 12th, Major Macmahon will take as the subject of his valedictory address, 'The Combinatory Analysis.' On the same evening the De Morgan medal will be presented to S. Roberts, F. R. S., who will be the fifth recipient of the medal.

ACCORDING to the authorized announcement of the University of the State of New York, Prof. W. M. Davis, of Harvard University, has been invited to prepare, for publication and distribution in the New York schools, a pamphlet, similar to that prepared for the State of Connecticut, as an aid to the more interesting and profitable study of geography. Prof. Davis has also consented to speak at the next University convocation on the present trend of the study of geography.

THE will of the late Sir John Erichsen bequeaths to University College his surgical instruments and appliances, and to University College Hospital £2,000 for the rebuilding fund exclusively.

THE thirty-sixth annual meeting of the National Educational Association will be held in Milwaukee during the first week of July of next year.

WE learn from *The Lancet* that the new Pathological Institute, which has been erected in the grounds of the Western Infirmary, Glasgow, was formally opened on the 14th inst. The institute comprises a large lecture room, post-mortem laboratory, practical class room, chemical and bacteriological laboratories, photographic room and private working rooms, in which original researches may be conducted, as well as a large and commodious museum. The total expenditure has exceeded £15,000. At the inaugural ceremony Prof. Gairdner delivered an address on the relation of the study of pathology to the art of medicine and the public health. Speeches were also delivered by Prof. Coats, Prof. Boyce (Liverpool), Dr. Leith, (Edinburgh), Mr. J. G. A. Baird, M.P., and Mr. J. Wilson, M.P.

It is announced that The Yerkes Observatory will be ready for dedication and occupancy by the middle of the present month. The first bulletin of the observatory giving an account

of its organization has already been issued. The bulletins will be published regularly and will contain announcements of new discoveries, and of the work of the observatory. There will also be published, under the title 'Contributions from the Yerkes Observatory,' papers contributed to various journals; and in quarto volumes 'Annals of the Yerkes Observatory,' containing accounts of research. The *Astrophysical Journal*, published by the University of Chicago, is now in its third volume and has maintained a high position as an international journal devoted to astro-physics and spectroscopy.

THE foundation stone of the Marine Biological Station, Firth of Clyde, was laid on the 18th of last month by Dr. Thomas Reid, who has given £500 toward the building fund. The site was given by the Marquis of Bute.

A NEW laboratory of bacteriology has been established at the University of Pennsylvania by the State Live Stock Sanitary Board, in connection with the veterinary department. The purpose of this is to study all diseases connected with poultry and cattle. Dr. M. P. Ravenel, of the medical faculty, has been made director and bacteriologist.

D. APPLETON & Co. announce the early publication of the completion of Herbert Spencer's system of philosophy. As first stated, this division of the *Synthetic Philosophy* was to be treated in two volumes, but in their preparation the amount of matter grew to such proportions that a third volume became necessary. It contains: Part VI., Ecclesiastical Institutions; part VII., Professional Institutions, and part VIII., Industrial Institutions.

AMONG other forthcoming books we notice 'Charles Darwin and the Theory of Natural Selection,' by E. B. Poulton (Cassell); 'An Autobiography of George Biddell Airy, Astronomer Royal from 1836 to 1881,' edited by Wilfrid Airy (Cambridge University Press), and 'Ancient Volcanoes of Britain,' by Sir Archibald Geikie, F. R. S., two volumes, illustrated (Macmillan).

A HOUSE divided against itself:

"I am much mistaken if the scientific spirit of the age is not doing us a great disservice,

working in us a certain great degeneracy. Science has bred in us a spirit of experiment and a contempt for the past. * * * We have made a perilous mistake in giving it too great a preponderance in method over every other branch of study."—Professor Woodrow Wilson, in the official oration at the Princeton Sesquicentennial. "Religious themes must be discussed in a scientific spirit and according to scientific principles."—President Patton in the official sermon.

BACTERIOLOGY is probably the newest of the sciences, but germs and animalculæ have for centuries been regarded as possible causes of disease. The *Lancet* makes the following curious quotation from the 'Life of Aly Pasha,' who was Governor of Janina about the beginning of the century: "'That man,' continued Aly, 'is one of those who see in the dark. Would you believe it? He pretends that the plague is composed of a vast number of minute animalculæ, which would be visible through a magnifying glass, if one could be procured of sufficient power.'"

Appleton's Popular Science Monthly for November contains, as usual, a number of interesting articles. Among them may be mentioned an illustrated article by Dr. Bashford Dean reviewing the public aquariums of Europe, more especially those at Naples, Amsterdam, Plymouth, Paris, Berlin and Brighton. Prof. A. S. Packard contributes an article describing an ascent of Mt. Shasta and a description of its crater. Prof. Harrison Allen publishes an address first delivered before the Academy of Natural Sciences, Philadelphia, describing the contributions to natural history made by Sir Thomas Brown and Sir Thomas Stanford Raffles. Prof. W. R. Newbold continues his interesting series of articles treating double personality. Prof. E. R. Shaw urges the employment of motor activities in teaching, and Prof. R. W. H. Hudson argues in favor of a natural moral standard. There is a sketch of William C. Redfield.

PROF. F. MAX MÜLLER's translation of the Kant's *Critique of Pure Reason*, originally issued in 1881 in commemoration of the centenary of its first publication, has been reprinted with alterations by The Macmillan Company. As peo-

ple seem more inclined to read books about literary and philosophical classics than the classics themselves, it is gratifying to find that there is a sufficient demand for a translation of Kant to warrant a new reprint in America. This must mean that there are many who read Kant, for it may be assumed that the great majority of those who care to read his works at all prefer to do this in the original. Prof. Max Müller has a perfect command of both German and English and effaces himself in the translation, not overburdening the text with philosophical or bibliographical notes. Kant was himself a man of science as well as a metaphysician, and while students of science are likely to find a certain insubstantiality in his *Critiques*, no one can read and understand them without securing a firmer foothold and a clearer outlook.

THE Open Court Publishing Company is performing a real service to science and philosophy by publishing, in excellent typography and at a low price, reprints of standard works. The last volume issued in the series, which is published bi-monthly at a yearly subscription price of \$1.50, contains the English translation of Prof. Ernst Mach's *Popular Scientific Lectures*. Prof. Mach is one of those leaders in science who, like Helmholtz and Huxley, regards it as part of his service to interest the general public in scientific questions. These lectures when delivered must have attained their end to an unusual degree. As reprinted they are of somewhat unequal merit. So much progress has been made in physiological optics and acoustics during the past thirty years that lectures on these subjects written in the sixties are somewhat out of date. The polemic against the classics seems extreme. A judicial adjustment of claims is not forwarded by speaking of the 'narrow provinciality of mind' of the Greeks, or of 'Aristotle with his incapacity to learn from facts.' On the other hand, several of the lectures, such as the one on 'The Economic Nature of Physical Inquiry,' contain important contributions to scientific method.

WE take from the foreign journals the following details of the life of Moritz Schiff, whose death was recorded in the last number of this

JOURNAL. Schiff was born at Frankfort-on-Main in 1823, and was therefore 73 years of age. He studied medicine at Heidelberg (under Tiedemann), Berlin (under Johann Müller), and Göttingen. After taking his degree, he proceeded in 1845 to Paris, where he worked under Magendie and Longet. On his return to Frankfort he was appointed Director of the Ornithological Department of the Zoological Museum there. During the political disturbances in 1848 he served as a military surgeon on the Revolutionary side. His Liberalism practically closed the doors of the German universities against him, and he was refused a qualification as *Privatdocent* in zoology by the University of Göttingen on the ground that his teaching would be dangerous to the young. In 1854 he was appointed to the chair of comparative anatomy in the University of Berne, and this post he occupied till 1863, when he accepted an invitation to become professor of physiology in the Instituto degli Studi Superiori at Florence. There he remained till 1876, when he accepted an offer of the chair of physiology in the University of Geneva, which he held till his death. In January, 1894, Geneva celebrated the fiftieth anniversary of his medical doctorate and his pupils undertook to publish his researches in a special edition, the last volume of which was completed just before his death. These volumes show the great range and importance of Schiff's physiological researches. These, as is well known, were especially on the nervous system, but he also made important contributions to the physiology of digestion and of secretion. Earlier in his life he had published valuable contributions to ornithology. Schiff had been driven from Germany for his liberalism and from Italy on account of his experiments on living animals, though, as in the case of Ludwig, his treatment of these was always most kindly. His character, was not, however, affected by this treatment, and he was greatly beloved by his students and by all who knew him.

SEVERAL committees made reports in the department of meteorology at the recent meeting of the British Association. The Committee on Meteorological Observations on Ben Nevis gave

the details of the year's work. The observers have been investigating in past years the influence of cloud or fog and clear weather respectively on the daily fluctuations of barometric pressure. For these observations the directors have resolved to establish a temporary station, intermediate in height between the summit and the low-level station at Fort William. The report on solar radiation was presented, also that on seismological observations. The latter stated that, now that it had been proved that any important earthquake is felt all over the globe, the committee consider that arrangements should be made for the record and study of these movements. The committee believe that such records might prove as important as those of, *e. g.*, terrestrial magnetism, and, just as they had magnetic observatories in various parts of the world, so in its opinion should there be seismological ones. For the experimental work of the coming year the committee had one instrument, and could have the use of another (constructed under a grant to Prof. Milne by the Royal Society); it wished to purchase two others, and would have to build piers, etc., and pay for photographic necessities and an assistant to run the instruments, which, altogether, would probably cost £200. In the report of the Committee on Meteorological Photographs full details were given of the method by which simultaneous photographs are taken, at two stations, 200 yards apart, of the same cloud in order to obtain the distance of the cloud from the observer. The sun is included in the photograph and serves as a reference mark in the measurements.

A CORRESPONDENT of the *N. Y. Evening Post* states that, to hold the new liquid fuel which is to be used hereafter in the German navy, large reservoirs holding over 100,000 gallons have been erected at Wilhelmshaven, and similar arrangements will be made at Kiel and Dantzic, a credit of nearly \$45,000 having been provided for this purpose in the last budget, besides \$22,500 for pumping plant in connection with the basins. After various trials, the authorities have decided to fit all existing large men-of-war with apparatus for heating their boilers partly with oil, and the use of liquid fuel will be provided for in all new constructions.